FOREST PRODUCTS
Project Fact Sheet

DISTRIBUTED WEB SENSOR FOR ON-LINE MEASUREMENT OF PAPER BASIS WEIGHT-MILL DEMONSTRATION PHASE

BENEFITS

- Improved productivity
- Enhanced product quality
- Reduced processing wastes
- Minimized raw material and energy requirements

APPLICATIONS

A new web sensor for paper basis weight would be transferred to the U.S. paper industry and other industries with web-based manufacturing processes. The commercialized technology will be installed as a retrofit in the same location as existing scanner technology with little or no paper line modification.

New Concept Will Replace Existing Point-Scanning Instrumentation

For the past four years, Pacific Northwest National Laboratory (PNNL) and ABB Automation have been pursuing development of a technology for a multi-point, non-scanning basis weight sensor. Unlike the current commercial scanning gauges, which sample only a small fraction of web area, this new technology offers continuous 100% coverage of the full sheet.

By enabling continuous measurements across the full web width, this stationary system will improve wet-end control and produce fine paper with more uniform basis weight. In turn, U.S. paper manufacturers will minimize raw material and energy requirements, thus improving their profitability. In this phase of the project, the technology will be demonstrated at the Boise Cascade Paper Company mill located in Wallula, Washington.

OFFICE OF INDUSTRIAL TECHNOLOGIES
ENERGY EFFICIENCY AND RENEWABLE ENERGY • U.S. DEPARTMENT OF ENERGY

PROJECT DESCRIPTION

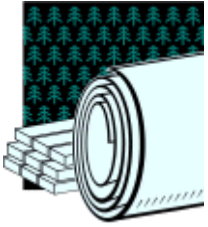
Goal: Assess the performance of the full web sensor concept in a production paper mill environment.

The proposed technique employs a beta scintillation system distributed across the full web width. A sealed Kr-85 beta source is positioned below the paper web. Beta particles transmitted by the web are detected by a stationary array of cesium iodide scintillators coupled via fiberoptics and fed to optical detectors located off-web. Basis weight measurements are made at 1-cm intervals across the web width. Measurement time is 1-10 seconds.

During the mill demonstration, researchers will monitor sensor sensitivity to mill variables such as temperature, vibration, dust, and sheet breakage. To verify accuracy, results will be compared with an existing commercial on-line basis weight sensor. Manufacturing costs for a full-web version of the PNNL basis weight sensor will be estimated.

PROGRESS & MILESTONES

- Researchers previously designed and built a prototype for the first phase of this project.
- The prototype was evaluated on the ABB Dynamic Tester and yielded accurate results.
- Researchers will conduct a commercialization study, finalize the web sensor's design, collaborate on a test plan, and fabricate a modified sensor system in the Fiscal Year 2001 extension.
- Mill demonstration will be conducted in Spring 2001 at Bosie Cascade's Wallula plant.



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